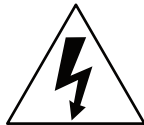

USER MANUAL

3D-DNR DAY & NIGHT COLOR CAMERA (650TVL)

 **Smart-iR**

Northern 

(650TVL) 3D-DNR DAY & NIGHT COLOR CAMERA



The lightning flash with an arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION - This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules & CE Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING - Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION : To prevent electric shock and risk of fire hazards:

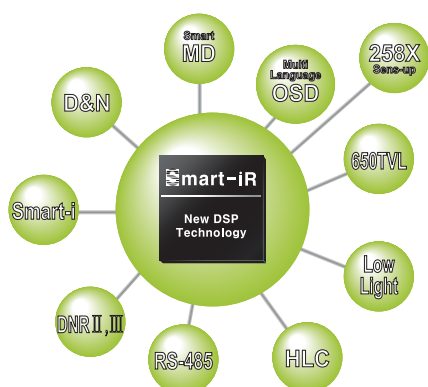
- ⚠ Do NOT use power sources other than those specified.
- ⚠ Do NOT expose this appliance to rain or moisture.

This installation should be made by a qualified service person and should conform to all local codes.

Contents

Contents	3
About 3D - DNR / Smart - IR	4
General Features	5
Precautions	6
Safety Instructions	7
Menu Set Up	8
▶ OSD Control Button	8
▶ Set Up Menu	9
▶ Menu Set Up	12
▶ Lens	13
▶ Exposure	14
▶ Back Light	16
▶ White Bal.	19
▶ Day & Night	20
▶ 3DNR	22
▶ Special	23
◆ Camera Title	23
◆ D - Effect	26
◆ Motion	28
◆ Privacy	29
◆ Defect	30
▶ Adjust	31
▶ Reset	32
▶ Exit	32
Trouble Shooting	33

About Smart-IR/D-WDR/BLC/3D DNR(650TVL)



Core Technology

New Smart-HD DSP Chipset Ensures 650TVL Ultra High Resolution.

Innovative Technology of Powerful Sens Up under Ultra Low Light Level : Min. Illumination 0.00001 Lux
Smart-i HD DSP is the 3rd generation core chipset actualizing 650TVL ultra high resolution!

One Step Upgrade: The best video quality even at night is ensured through 2D/3D filtering with the function of noise removal.

3D-DNR, Min. Illumination 0.00001 Lux (sens-up*258x)

All In One: 3DDNR, Smart IR, HSBLC, Privacy Zone, RS-485 (Option)



Smart-IR OFF



Smart-IR ON



Smart-IR

No Saturation Image, Vivid Image in darkness!

HDPRO "Smart IR" camera makes very sharp video image in darkness!

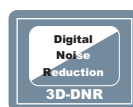
This technology eliminates saturation of video image of the closer object in darkness by control of the IR sensitivity. Saturation never happens in our "Smart IR" cameras, you can enjoy vivid image in any dark condition!



3D-DNR OFF



3D-DNR ON



3D Filtering Method of Newly Advanced DNR Function

Newly developed 3D filtering enhances Digital Noise reduction at low light levels. 3D Filtering of the Video Signal Optimises the Signal to Noise ratio, giving vastly improved low light visibility and a powerful Sens-Up function (up to 256 times magnification).



Standard Camera



650TV Lines Camera



650TV Lines

The combination of a Sony Super HAD CCD image sensor and DNR DSP provides an excellent resolution of 650 TV lines.



Digital WDR OFF

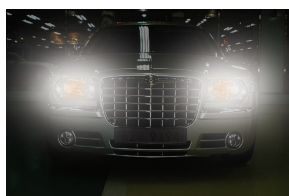


Digital WDR ON



D-WDR(Digital Wide Dynamic Range)

D-WDR is a powerful and ultra advanced technology that captures cleaner and superior high Resolution pictures even where images appear dark because there is a strong back light present.



Normal BLC

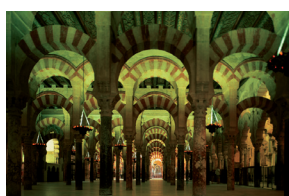


HS BLC

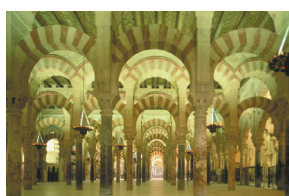


High Spotlight BLC Function

High Spotlight BLC Function is Especially Effective to Read the Number Plate of the Vehicles in the Street or Parking Lot at Night Time. Especially Users Can Adjust and Select the Special Required Area to Observe the Target Object Under the Strong Spots of Light Exist.



Standard Image



Minimum Illumination Image



Illumination

With an Incredibly Minimum Illumination of Amazing 0.00001Lux can Capture Good Images Even in Extremely Low Light Conditions and Related Noises are Significantly Reduced by the Ultra Advanced DNR(Digital Noise Reduction) Technology.

General Features



3D Filtering Method of Newly Advanced DNR Function

- Newly developed 3D filtering enhances Digital Noise reduction at low light levels. 3D Filtering of the Video Signal Optimises the Signal to Noise ratio, giving vastly improved low light visibility and a powerful Sens-Up function (up to 256 times magnification).



650TV Lines

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D-WDR(Digital Wide Dynamic Range)

- D-WDR is a powerful and ultra advanced technology that captures cleaner and superior high Resolution pic-tures even where images appear dark because there is a strong back light present.



High Spotlight BLC Function

- High Spotlight BLC Function is Especially Effective to Read the Number Plate of the Vehicles in the Street or Parking Lot at Night Time. Especially Users Can Adjust and Select the Special Required Area to Observe the Target Object Under the Strong Spots of Light Exist.



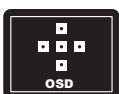
Illumination

- With an Incredibly Minimum Illumination of Amazing 0.00001Lux can Capture Good Images Even in Extremely Low Light Conditions and Related Noises are Significantly Reduced by the Ultra Advanced DNR(Digital Noise Reduction) Technology.



Smart-IR

- No Saturation Image, Vivid Image in darkness! HDPRO "Smart IR" camera makes very sharp video image in darkness! This technology eliminates saturation of video image of the closer object in darkness by control of the IR sensitivity. Saturation never happens in our "Smart IR" cameras, you can enjoy vivid image in any dark condition!

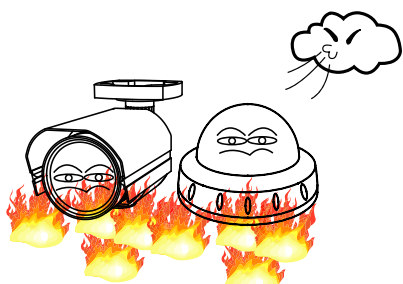


Additional Functions

- OSD - On Screen Display menu with multi-Language support.
- Privacy Masking - 8 zones, Sens-Up - x256 times, Digital Zoom - x32

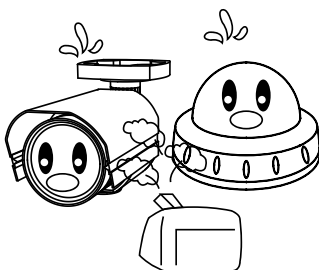
Precautions

Do not install the camera in extreme temperature conditions.



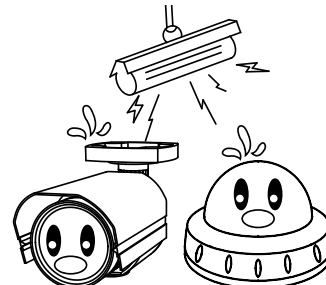
Only use the camera under conditions where the temperatures are between $-20^{\circ}\text{F} \sim 122^{\circ}\text{F}$

Do not install or use the camera in an environment where the humidity is high.



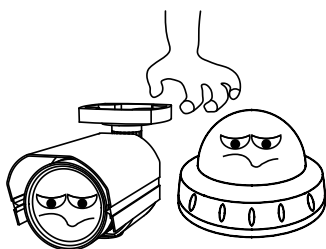
Do not install or use the camera in an environment where the humidity is high.

Do not install the camera under unstable lighting conditions.



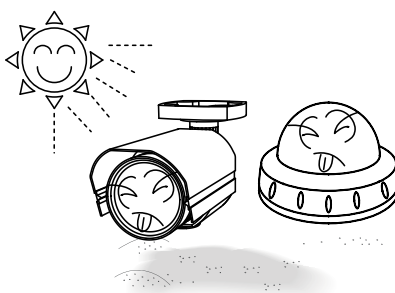
Severe lighting change or flicker can cause the camera to work improperly.

Do not touch the front lens of the camera.



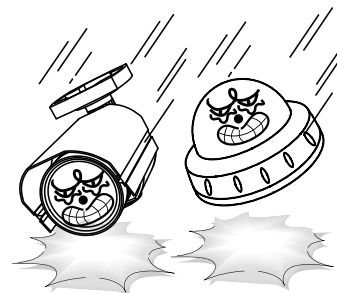
This is one of the most important parts of the camera. Be careful not to leave fingerprints on the lens cover.

Never keep the camera pointed directly at strong light.



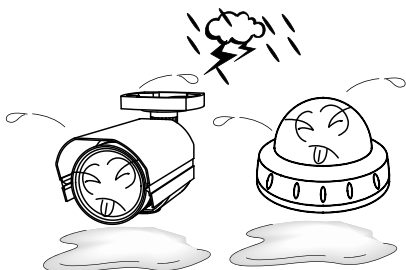
It can cause malfunctions to occur.

Do not drop the camera or subject it to physical shocks.



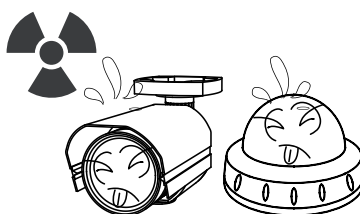
Housing damage can compromise weatherproof ratings.

Do not expose internal components to rain or moisture.



If it gets wet, wipe dry immediately. Liquids can contain minerals that corrode the electronic components.

Do not expose the camera to radioactivity.



If exposed to radioactivity the CCD will fail.

NOTE

* If the camera is exposed to spotlight or object reflecting strong light, smear or blooming may occur.

* please check that the power satisfies the normal specification before connecting the camera.

Safety Instructions

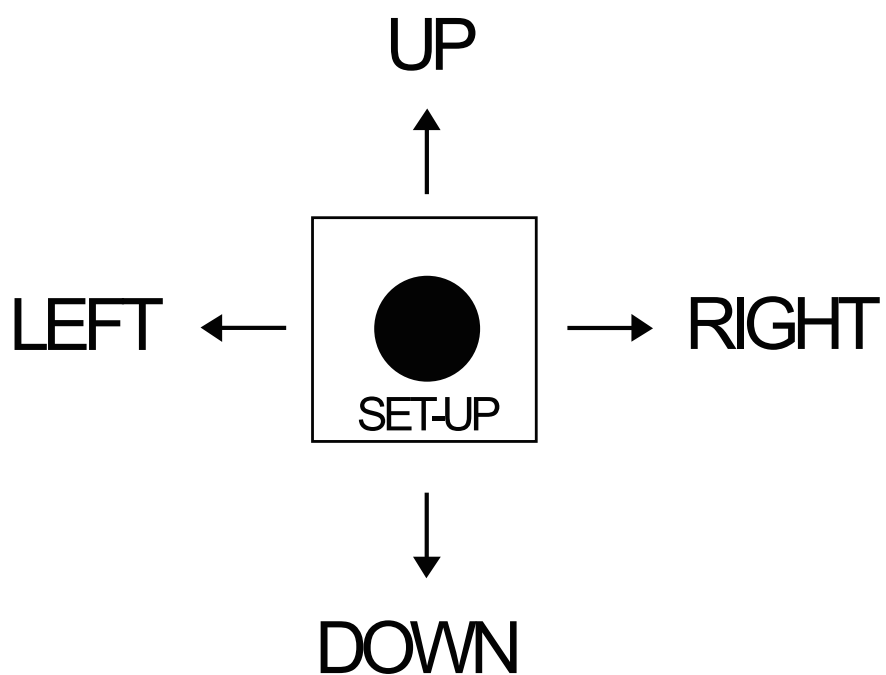
Precautions for use

- ❶ This camera should be installed by qualified personnel only
- ❶ Do not disassemble this camera, there are no serviceable parts inside.
- ❶ Use a UL approved regulated 24 volt AC or 12 volt DC power supply
- ❶ Use appropriate low voltage power cable to prevent fire or electrical shock
- ❶ Please insure that your installation area can support the weight of the camera

Please handle this camera carefully :

- ❶ Do not use a strong or abrasive detergent when cleaning the camera
- ❶ Do not point the camera directly into sunlight.
- ❶ Do not install camera in places where humidity is high
- ❶ Do not install near cooling or heating device
- ❶ Do not expose internal components to rain or moisture.

OSD Control Button



How to Set Up the camera menu

● Setup Menu

SET UP MENU	DEFAULT SET	MENU		
LENS	DC	BRIGHTNESS (0~100 Adjustable)		
		RETURN	RET	
	MANUAL		END	
EXPOSURE	SHUTTER	AUTO, 1/60, 1/50, FLK, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000, x256, x128, x64, x32, x16, x8, x4, x2		
	AGC	OFF		
		LOW		
		MIDDLE		
		HIGH		
	SENSE-UP	OFF		
		AUTO	SENSE-UP(x2 ~ x256 Level Selectable)	
	BLC	RETURN	RET	
			END	
		OFF		
		BLC	GAIN	LOW
				MIDDLE
				HIGH
			AREA	POSITION
		HSBLC	SIZE	AGAIN
			DEFAULT	
			RETURN	RET
				END
	D-WDR	INDOOR	LEVEL	0~8 Selectable
			MODE	ALL DAY
				NIGHT ONLY
		OUTDOOR	AREA	POSITION
			SIZE	AGAIN
			DEFAULT	
	RETURN	OFF	RETURN	RET
				END
WHITE BAL	ATW			
	AWB			
	AWC->SET			
	MANUAL	BLUE (0 ~100 Level Selectable)		
		RED (0 ~100 Level Selectable)		
	INDOOR	RETURN	RET	
			END	
	OUTDOOR			

DAY/NIGHT	COLOR				
	AUTO	DELAY (0 ~63 Adjustable)			
		D->N(AGC) (48 ~208 Adjustable)			
		N->D(AGC) (0 ~160 Adjustable)			
		RETURN	RET		
		END			
	EXT				
	B/W	BURST	ON/OFF		
		IR SMART	ON	GAIN	
				AREA	
RETURN (RET/END)					
OFF					
3DNR	ON	LEVEL (RANGE 0 ~100 Level Selectable)			
		RETURN	RET		
		END			
	OFF				
SPECIAL	CAM TITLE	ON/OFF			
	D-EFFECT	FREEZE	ON/OFF		
		MIRROR	MIRROR		
			V-FLIP		
			ROTATE		
			OFF		
		D-ZOOM	ON	D-ZOOM (x1 ~ x32)	
				PAN (-100 ~ 100)	
				TILT (-100 ~ 100)	
				RETURN (RET/END)	
		NEG. IMAGE	ON/OFF		
		RETURN	RET		
	END				
	MOTION	ON	AREA SELECT (AREA1 ~ AREA4)		
			AREA DISPLAY	POSITION	
				SIZE	
				AGAIN	
			SENSITIVITY (0 ~ 40)		
			MOTION VIEW	ON/OFF	
			RETURN	RET	
			END		
		OFF			
	PRIVACY	ON	AREA SELECT		
			AREA DISPLAY	POSITION	
				SIZE	
				AGAIN	
			COLOR		
			RETURN	RET	
			END		
OFF					

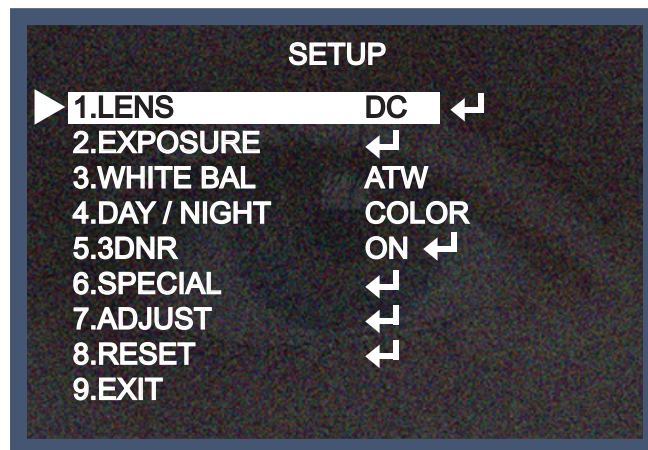
	DEFECT	SENSE-UP (x4 ~ x64)		
		DIFFERENCE (1 ~6)		
		START		
		RETURN	RET	
			END	
	RETURN	RET		
		END		
ADJUST	SHARPNESS	0 ~31 Level Adjustable		
	MONITOR	CRT	LEVEL (0 ~63)	
			BLUE GAIN (0 ~100)	
			RED GAIN (0 ~100)	
			RETURN	RET
				END
		LCD	GAMMA (USER ~ 1.00)	
			LEVEL (0 ~63)	
			BLUE GAIN (0 ~100)	
			RED GAIN (0 ~100)	
			RETURN	RET
				END
		USER	GAMMA (USER ~ 1.00)	
			LEVEL (0 ~63)	
			BLUE GAIN (0 ~100)	
			RED GAIN (0 ~100)	
			RETURN	RET
				END
	RETURN	RET		
		END		
RESET	FACTORY	RESET		
	RETURN	RET		
		END		
EXIT				

Menu Set Up

Menu items can be selected by using the OSD buttons of the camera

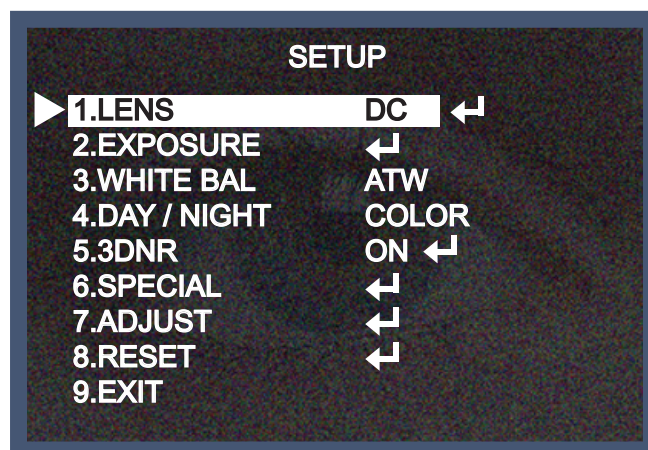
1. Press the Set Up button.

* The Set Up menu will be displayed on the monitor.



2. Move and select the required function using the Up and Down button.

* Move the arrow indicator Up or Down to select the desired feature by pressing the Up or Down button.




3. Change menu settings using the Left or Right button.

* Available values or Status are displayed by pressing the Left or Right buttons.

Press the button until desired value / status is displayed.

4. After Changing the setting move the arrow indicator to EXIT and press the SET button to EXIT.

NOTE

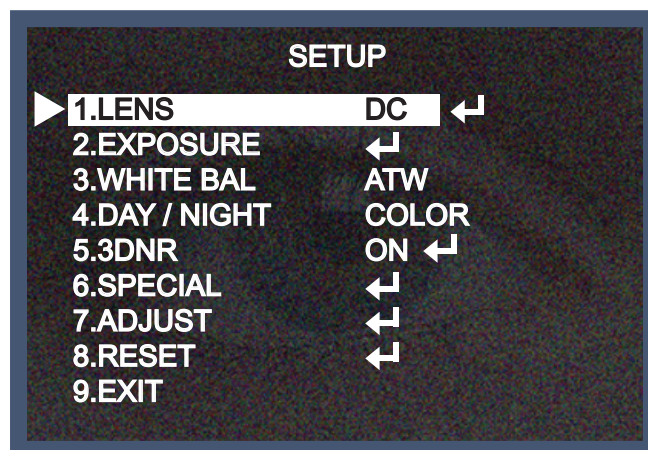
* Move to the available submenu by moving  arrow to desired feature.

* Submenu is not available when this symbol is display "- - - -"

Lens

1. Move the arrow indicator to LENS using the Up and Down buttons on the Set Up menu screen.

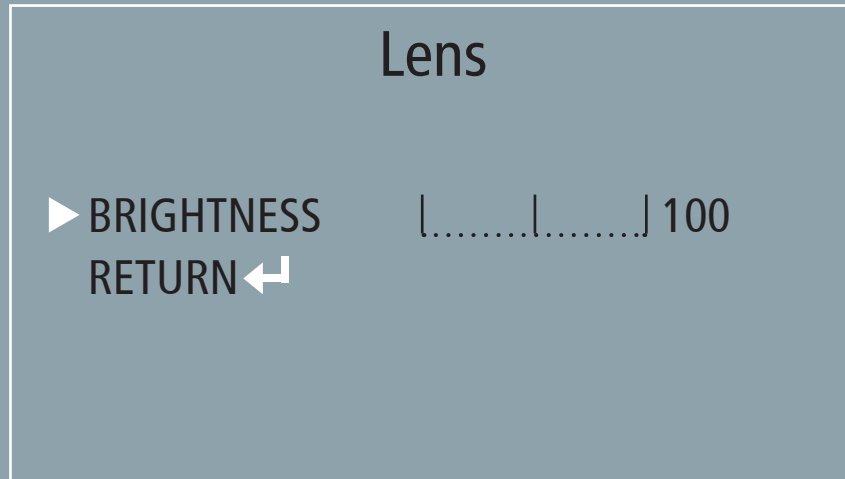
2. Select the desired lens type by pressing the Left or Right button.



 DC:DC Auto Iris Lens

NOTE

* When DC is selected, the brightness can be adjusted. The brightness control range is 1 ~ 100.

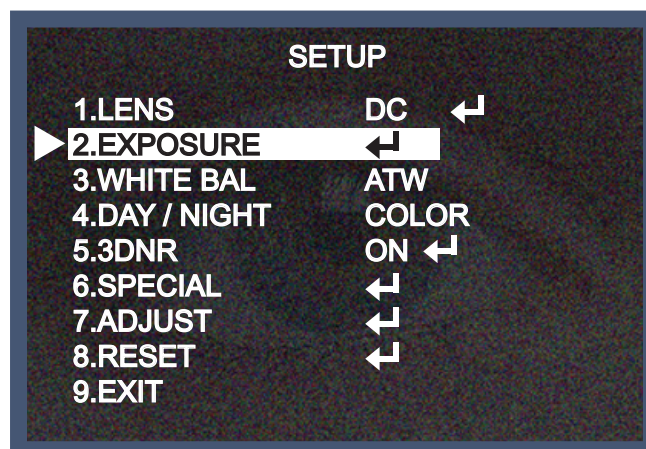


3. Press the RETURN to return to the SETUP menu.

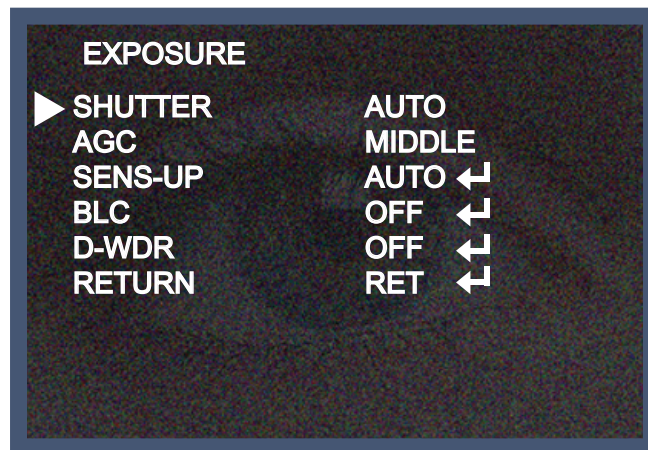
Exposure

This function is used to select Automatic or Manual shutter speed control.

1. On the Set Up menu screen select EXPOSURE by using the Up or Down button.
2. Select the desired shutter mode by pressing the Left or Right button.



* FLK : Select FLK mode when flickering occurs; caused by the unmatched frequency of electric lights.



NOTE

*Shutter: Select Shutter using the Up or Down button, you can adjust the shutter speed from 1/60, FLK, 1/250~1/100,000.

→FLK: Select FLK mode if flickering occurs; caused by the unmatched frequency of electric light. If select FLK mode, sense-up does not operate.

* AGC(AUTO GAIN CONTROL):

A higher gain increases brightness but also increases any noise.

OFF : Deactivates the AGC function

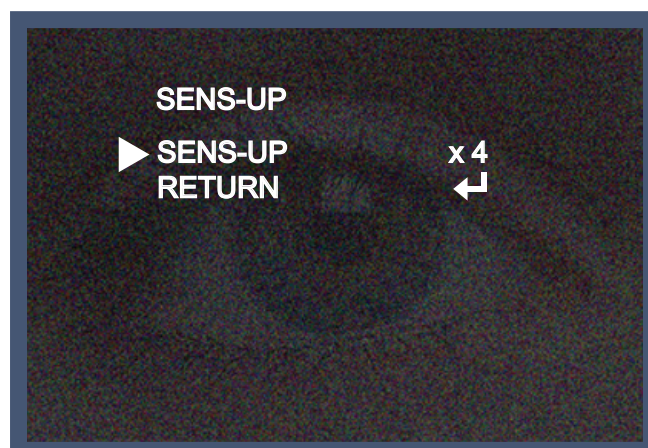
LOW : Sets automatic gain control to LOW.

MIDDLE : Sets automatic gain control to MIDDLE.

HIGH : Sets automatic gain control to HIGH

* SENS - UP:

At night and/or in dark conditions, the Sens-Up mode can be selected to desired value from x2 ~ x256.



* RETURN:

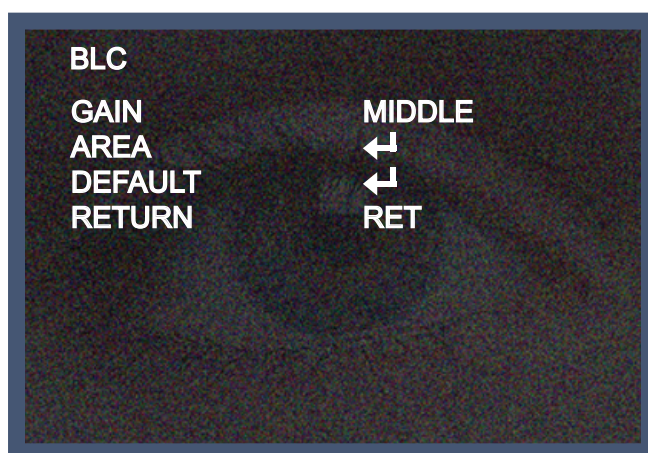
Select Return to save the changes in the EXPOSURE menu and return to the SETUP menu.

NOTE

- * Pressing the SET button in AUTO mode allows adjustment of image brightness by increasing or decreasing the shutter speed (x2 ~x256).
- * The higher the level, the brighter the image becomes, but it is possible that an after image (ghosting) could appear.
- * When SENS-UP is activated the increased magnification can induce noise and pixelation; this is quite normal.

Back Light(BLC)

This camera which is using 3D-DNR DSP provides intelligent light level control to overcome even strong backlight conditions.



* OFF: BLC function does not operate.

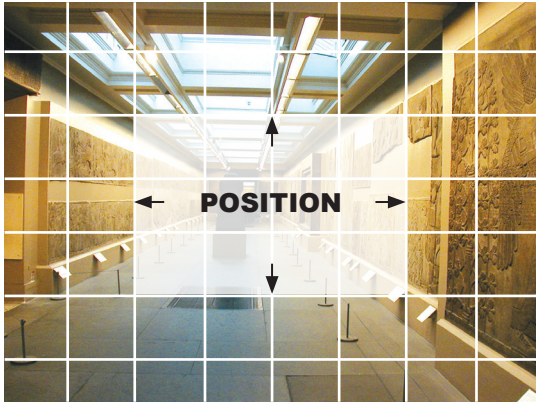
* BLC: Select LOW/MID/HIGH

User can select and define a specific area in scene and view the area clearly.

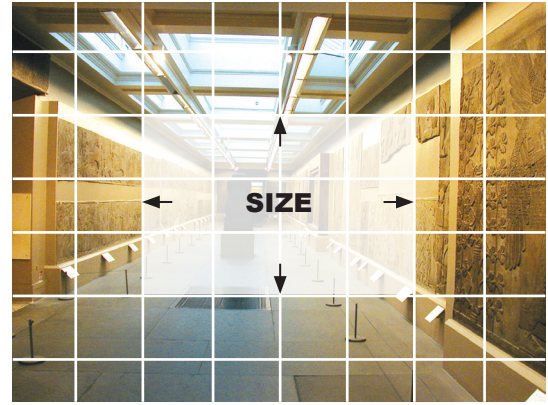
Press the "ENTER" button at the AREA menu, you can change the area like a picture 1.

Press the "ENTER" button again after area setting, you can change the area like a picture 2.

Default: Press the Default to return to factory defaults.



PICTURE 1



PICTURE 2

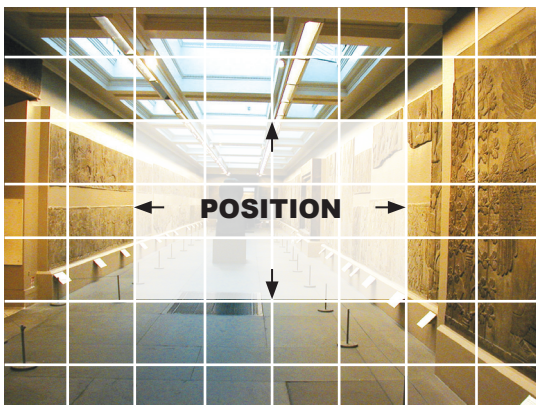
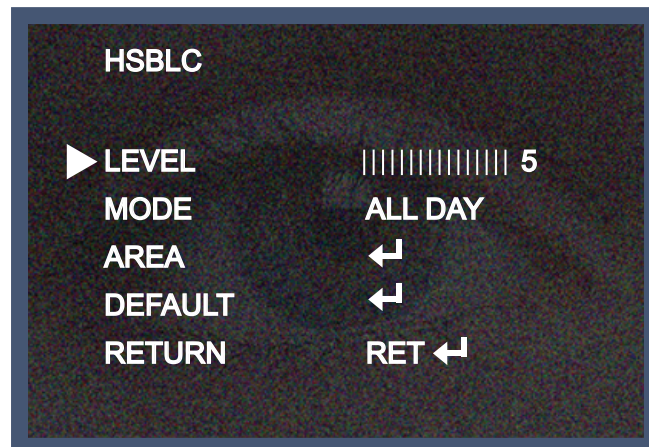
* HSBLE: HSBLC function is especially effective for reading car number plates at the night time.

You can select and define the required observation area for the target object and ignore a strong light area.

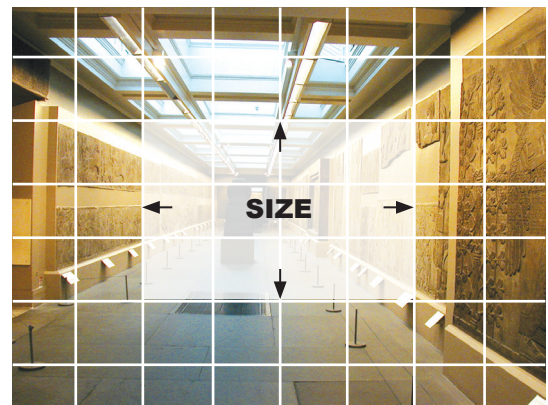
Press the "ENTER" button at the AREA menu, you can change the position as shown in Picture 1.

Press the "ENTER" button again after area setting, you can change the position as shown in Picture 2.

Default: Press the Default to return to factory defaults.



PICTURE 1



PICTURE 2



HSBLC OFF



HSBLC ON

* D-WDR: This camera which is using 3D-DNR DSP provides intelligent light level control to overcome even strong backlight conditions.

→OFF: D-WDR function does not operate.

When there are simultaneous bright & dark image area WDR makes them both distinct and can be selected as OUTDOOR and INDOOR.



D-WDR OFF



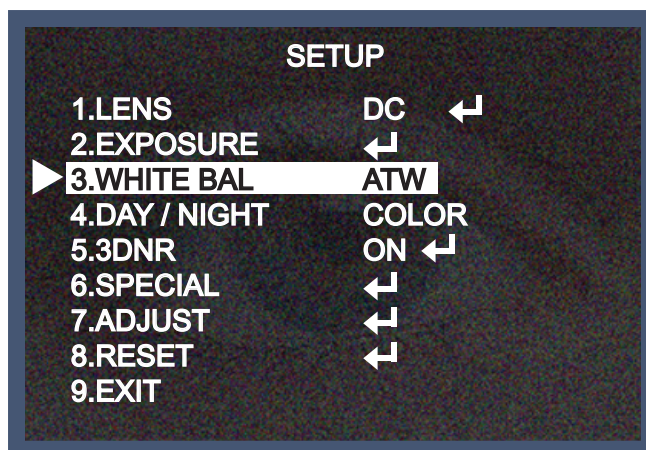
D-WDR ON

* RETURN: Select Return to save the changes in the EXPOSURE menu and return to the SETUP menu.

White Balance

The White Balance function is used to control the "on-screen" colors.

1. Move the arrow indicator to WHITE BAL on the SETUP menu screen using the Up and Down button.
2. Select the desired mode by using the Left or Right button.



* **There are three user selectable White Balance settings available.**

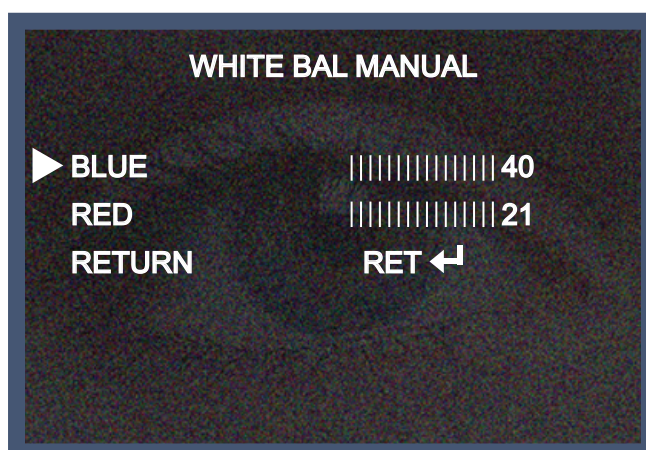
* ATW : (Auto Tracking White Balance)

Normal setting; when the color temperature range is from 1,800°K to 10,500°K. (Ex: a fluorescent lamp or outdoors)

* AWB : The White Balance is automatically adjusted in a specific environment.

* AWC → SET : To obtain the best results press the SET button while the camera is focused onto white paper. If the environment, and/or light source changes, the White Balance will require re-adjustment.

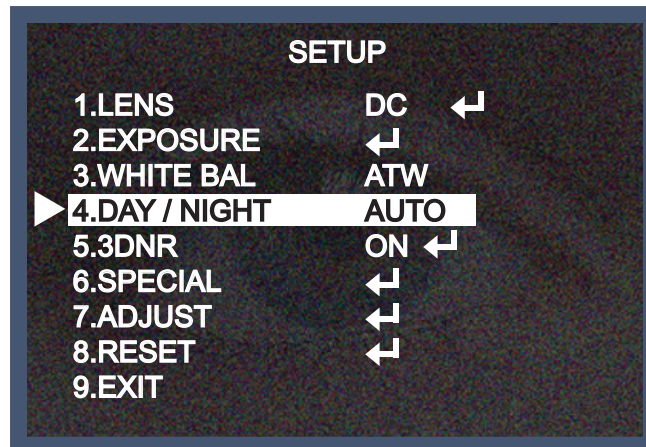
* MANUAL : Used for fine adjustment of White Balance. Set White Balance first using ATW or AWC then change to MANUAL and press SETUP button. Increase or decrease the value of R-Gain(Red) and B-Gain(Blue) while monitoring the color of the image.



Day / Night

Picture can be displayed in either colour of black and white.

1. Select DAY / NIGHT using the Up or Down button on the SETUP menu screen.



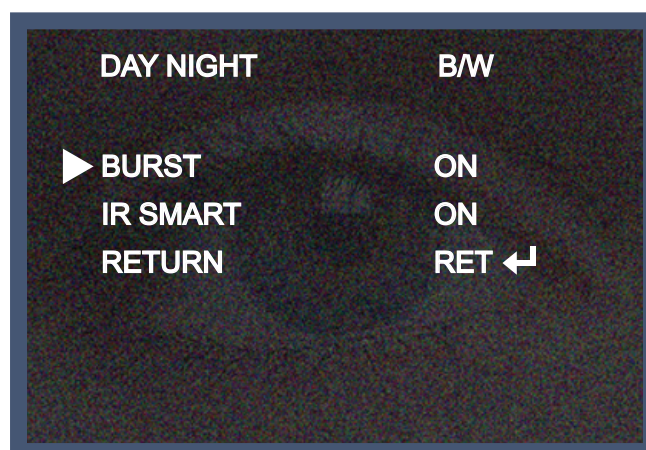
2. Select the desired mode using the Left and Right buttons.

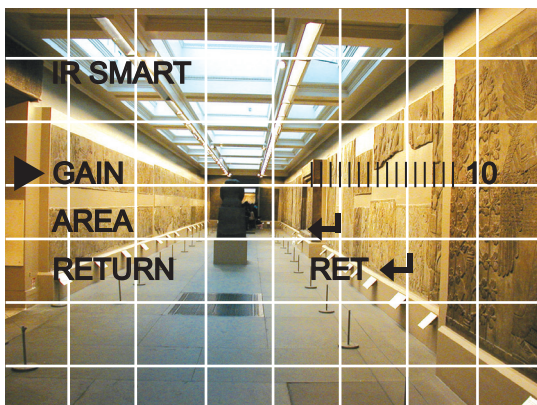
* COLOR : The picture is always displayed in color.

* BW : This picture is always displayed in black and white.

Select BW using the button and press the menu to activate COLOR BURST option.

IR SMART : It controls the IR LED(bright portion base), saturation is not expected.





AREA



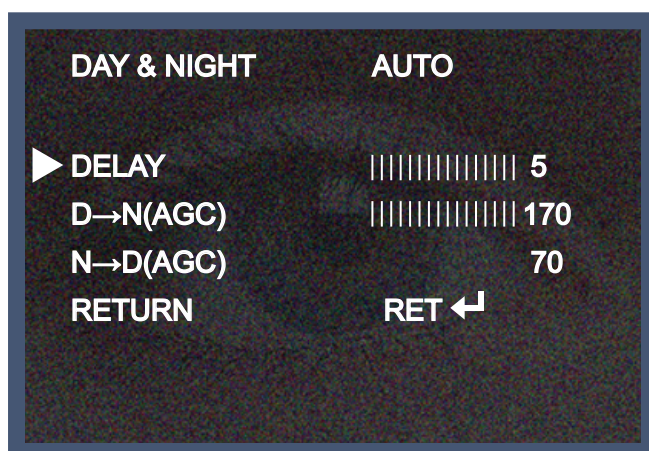
SMART IR OFF



SMART IR ON

→ AUTO: The mode will automatically switches to COLOR in normal condition and switches to BW mode when ambient illumination is low.

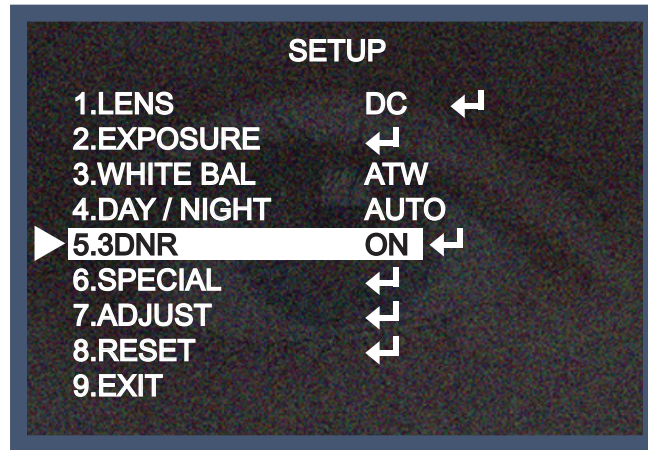
Press the SET button to set the switching time or D→N(AGC), N→D(AGC) in AUTO mode.



3DNR

3DNR is used to reduce the level of background noise in a low luminance environment.

1. Move the arrow indicator to 3DNR by using the Up and Down button.



2. Select whether or not to activate 3DNR by using the Left and Right buttons.

* ON: Activates 3DNR - Digital noise reduction can be adjusted between 0 ~ 100.

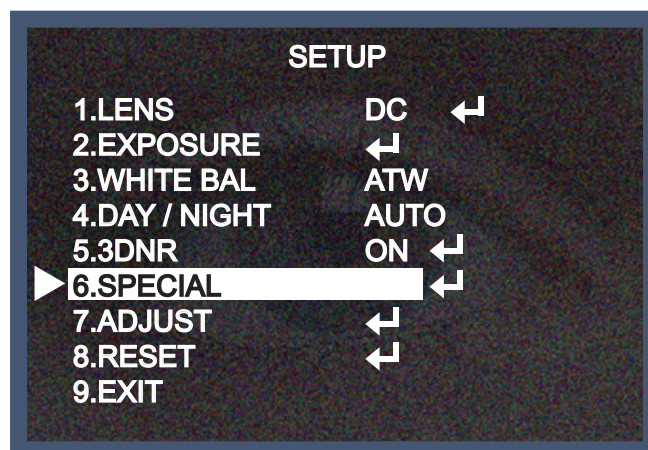
* OFF: Deactivates 3DNR - noise is not reduced.



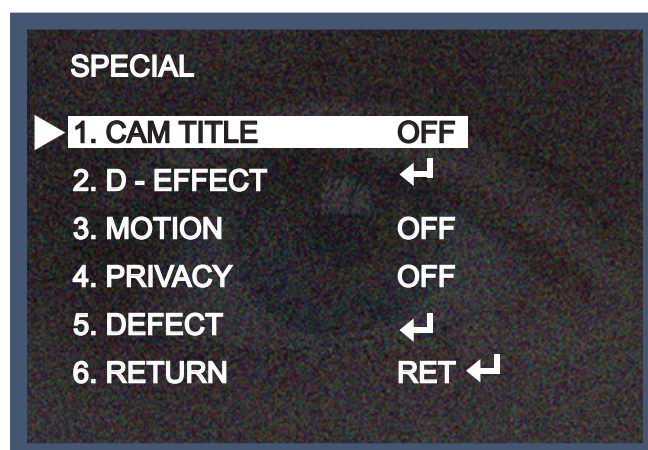
* Select RETURN by using the Up or Down button to return to Set Up menu.

Special

When the SETUP menu screen is displayed, select SPECIAL using the Up and Down buttons.



Select one of the mode using the Up and Down button.



1. CAM TITLE : When input, the Camera ID is displayed on the monitor.

1-1) Move the arrow indicator to CAMERA ID using the Up or Down button on the SETUP menu screen.

1-2) Set to ON using the Left or Right button.

NOTE

* When CAMERA TITLE is set to OFF, the CAMERA TITLE is not displayed on the monitor.

1-3) Press the SETUP button.



1-4) The CAMERA TITLE can be up to 15 alphanumeric characters in length.

① Move the cursor to choose an alphanumeric character.



② Choose a character in displayed range A~Z, a~z, 0~9 using the Up, Down, Left and Right buttons.

③ Select the desired character by pressing the SETUP button.

- The cursor moves to the next position, after character input, by pressing the SETUP button.

④ Repeat the above steps until the Camera ID has been created.

NOTE

* In cases where the wrong Camera ID has been input.....

Move the cursor to CLR and press SETUP button to erase characters from left to right, and repeat the above steps to input the characters again.

1-5) To select the position where the Camera ID should be displayed on the screen.

① Move the cursor to POS and press the SET button.



② Created camera ID is displayed.

(Factory default position)

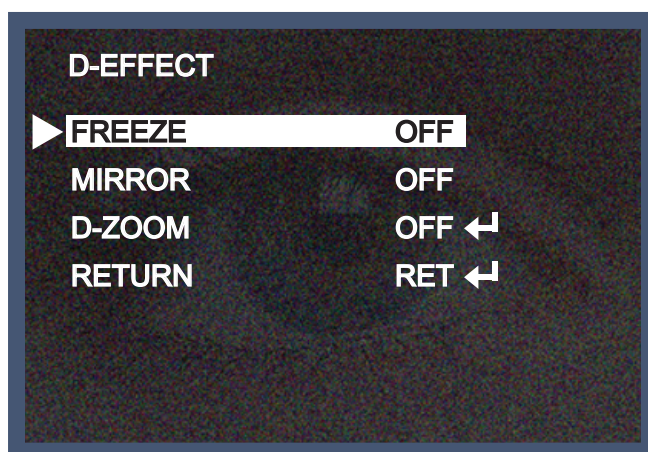


③ Select a new position by using the four directional button, Press the SET button to confirm the position.

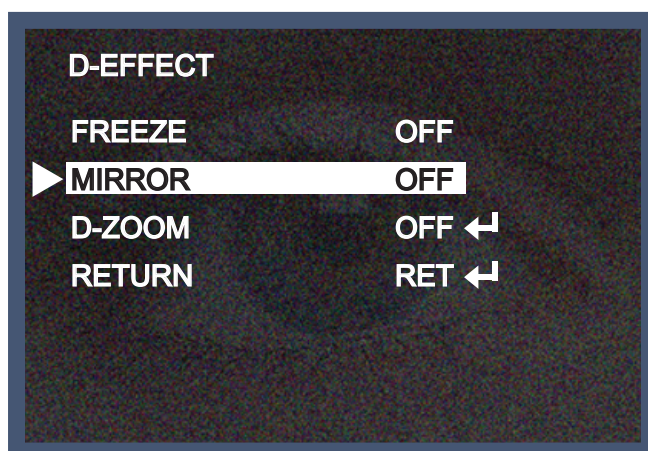


2. D - EFFECT

Move the cursor to D-EFFECT and press the SET button to set the other image functions.



2 -1) MIRROR : Flip the image horizontally on the screen.



- * V-FLIP : Flip the image vertically on the screen.
- * ROTATE : Flip the horizontal image vertically on the screen.
- * OFF : Disabled.



MIRROR ON

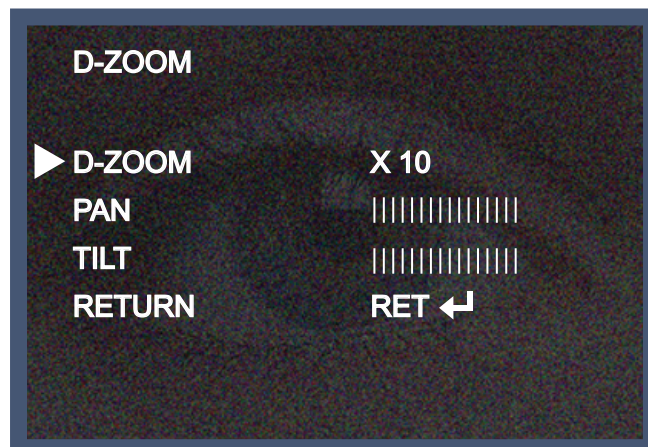


MIRROR OFF

2-2) D - ZOOM: Digital zoom available, range x1 ~ x32.

PAN : The pan range can be controlled between -10 ~ + 100

TILT : The tilt range can be controlled between -10 ~ + 100



NOTE

- * PAN and TILT function should be available when using the digital zoom.

2-3) GAMMA : Desired gamma values can be adjusted between 0.05 ~ 1.00.

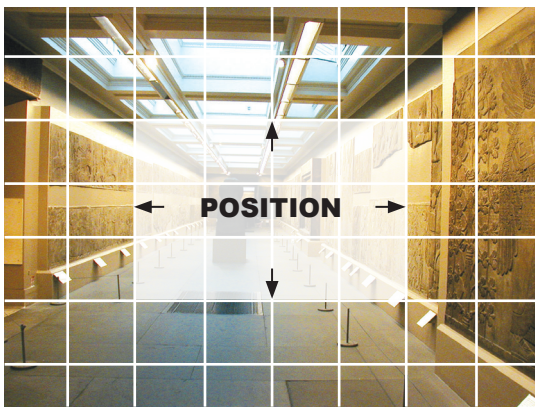
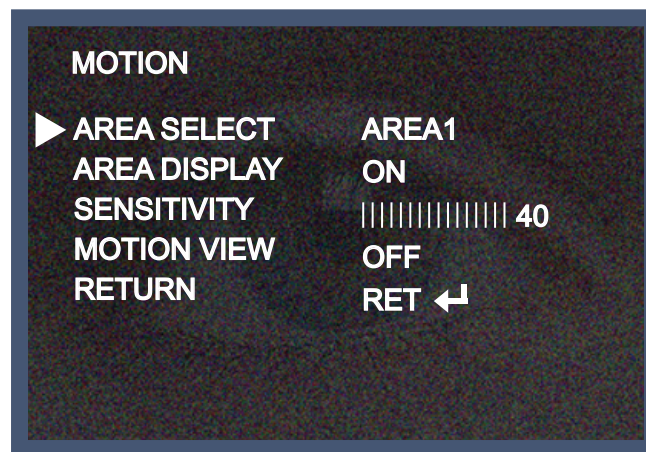
2-4) NEG. IMAGE :

ON : Activates negative image just like film

OFF : Normal image

2-5) RETURN : Move the arrow indicator to RETURN after complete the setup to return to SPECIAL menu.

3. MOTION



3-1) When the special menu screen is displayed, use the Up or Down button to access the MOTION menu.

AREA SELECT : You can select from area 1~4 position.

AREA DISPLAY) ON: Display the Motion Detected area on the screen. You can set the location and size like a picture 1,2.

SENSITIVITY: To setup the motion sensitivity. You can adjust the motion sensitivity of a movement between level 0~40.

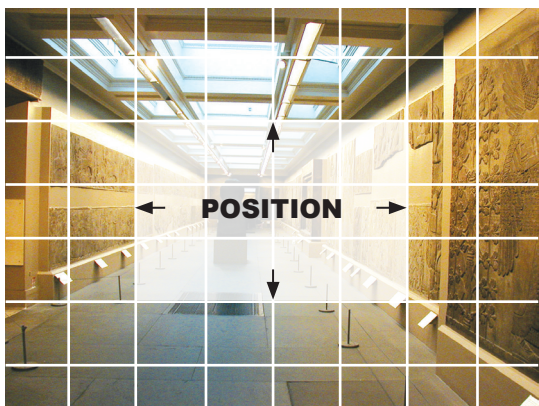
MOTION VIEW : If camera detects movement, the words of "MOTION DETECTION" will appear on the monitor.

RETURN : To return to the SPECIAL menu after completing the setup.

4. PRIVACY

Hide an area you want to hide on the screen.

4-1). When the SPECIAL menu screen is displayed, press the Up and Down buttons to set to PRIVACY.



4-2). Set up the area mode using the 4 direction buttons.

① AREA SELECT : You can select up to 8 MD area.

② AREA DISPLAY : OFF : Disabled

ON : Activates area displa

- ③ Move the arrow indicator to WIDTH to make desired width of cells to increase or decrease by using the Left / Right button between the level 0 ~ 100.
- ④ Move the arrow indicator to HEIGHT to make desired height of cells to increase or decrease by using the Left / Right button between the level 0 ~ 100.
- ⑤ Move the arrow indicator to the LEFT / RIGHT and TOP / BOTTOM to select the desired area position by using the LEFT or RIGHT button.
- ⑥ Move the arrow indicator to COLOR to select the desired color of each area cells by using the Left / Right button to select between the 15 different color.

RETURN : Move the arrow indicator to RETURN after completing the setup to return to SPECIAL menu.

4-3) SYNC : INT (Internal Synchronisation)

Move the arrow indicator to RETURN after complete the setup to return to SETUP menu.

5. DEFECT

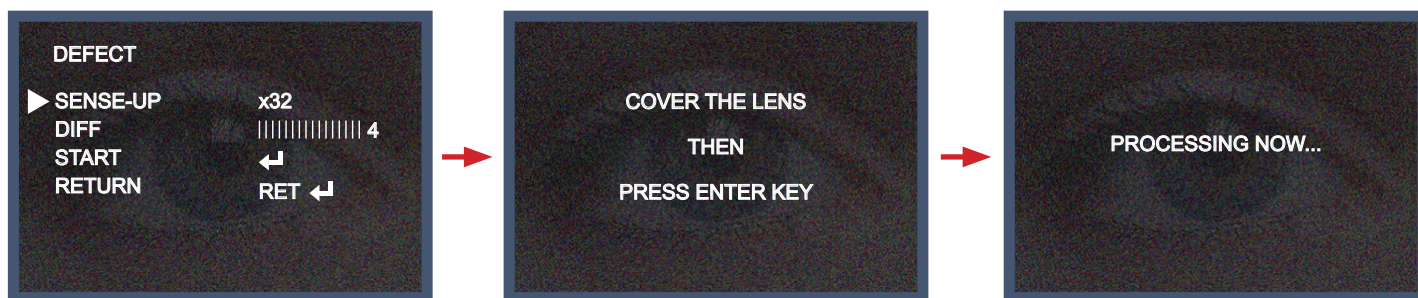
You can eliminate white spots (defect) up to max 128 point.

SENSE-UP : To eliminate defect, set the high level of sense-up. You can set to max 64x, but 32x is best to eliminate defect.

DIFF : You can set the size of DEFECT from 1 to 6.

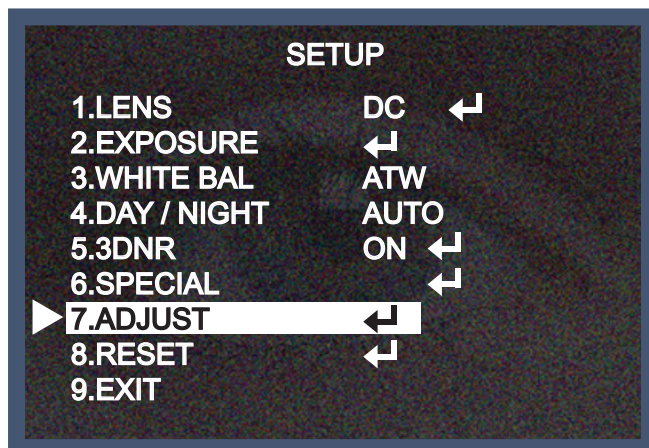
START : Press the "ENTER" button, it will start to eliminate defects "PROCESSING NOW..." will be displayed on the monitor.

In case of manual IRIS lens, you should cover the lens.



ADJUST

1. When the SETUP menu screen is displayed, select ADJUST using the Up and Down buttons.



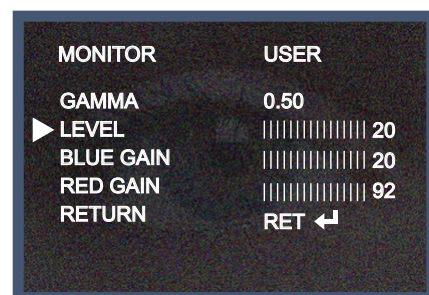
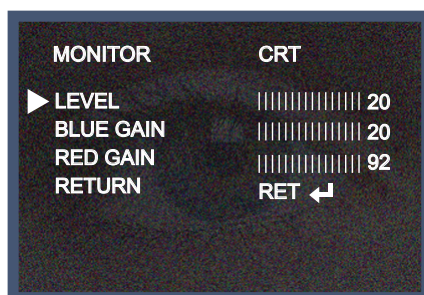
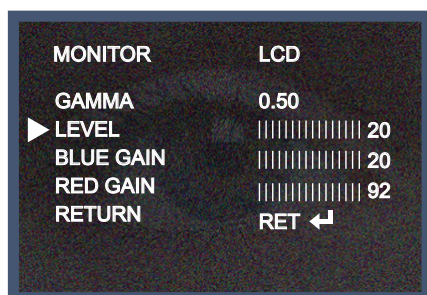
2. Select the desired mode by using Up or Down button..



SHARPNESS : Improving image clarity. The level can be adjusted to obtain an improved image.

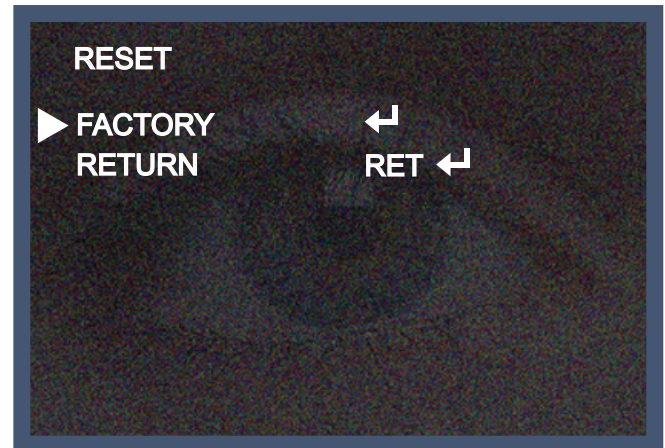
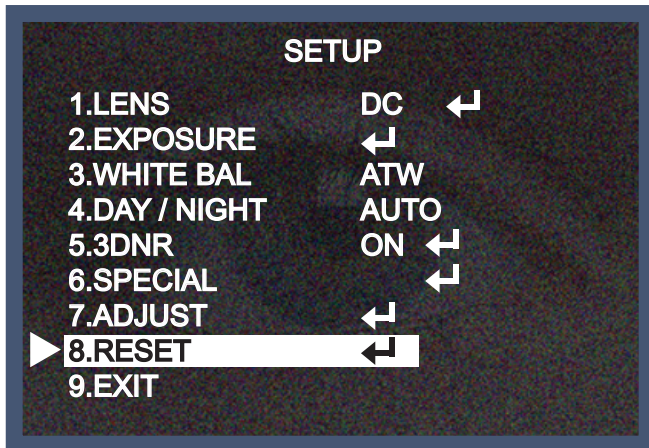
However, when the level is set too high it can distort the image or cause noise.

You can adjust from level 1 to 31, and can set to monitor function as LCD, CRT and USER.



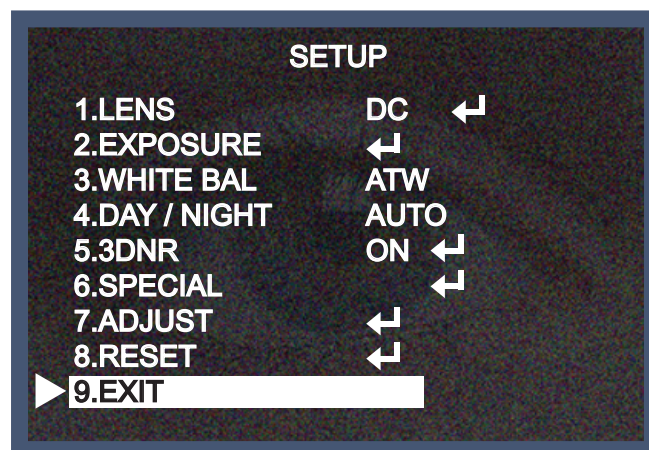
RESET

Resets the camera settings to the factory defaults.



EXIT

Press the SET button in the EXIT menu to save the current settings and exit the SETUP menu.



Trouble Shooting

PROBLEM	POSSIBLE CAUSE
Nothing appears on the screen.	☞ Check the power cable, power supply output and video connection between the camera and monitor.
The image on the screen is dim.	☞ Are the camera lens or the lens glass dirty? Clean the lens / glass with a soft clean cloth. ☞ Adjust the monitor controls, as required. ☞ If the camera is facing a very strong light, change the camera position. ☞ Adjust the lens focus.
The image on the screen is dark.	☞ Adjust the contrast control of the monitor. ☞ If there is an intermediate device, correctly set the 75Ω/Hi-z.
The camera is not working properly and the surface of the camera is hot.	☞ Check the camera is correctly connected to an appropriate regulated power source.
Motion Detection is not activated.	☞ Has MOTION DET been set to ON in the menu? ☞ Has MD AREA been properly defined?
The color of the picture is not correct.	☞ Check the settings in WHITE BALANCE menu.
The image on the screen flickers.	☞ Make sure that the camera isn't facing direct sunlight or fluorescent lighting. If necessary, change the camera position.
The SENS-UP does not work.	☞ Check that the AGC setting in the EXPOSURE menu isn't set to OFF. ☞ Check the EXPOSURE menu and make sure SHUTTER is set to-----

- MEMO -

- MEMO -

